

Remarks

Please note that the amendments included herein utilize the revised amendment format permitted by the U.S.P.T.O. (See 1267 OG 106 (2/25/03)) Accordingly, no clean version nor marked up version of the changes is provided. Claims 11-15 and 23-24 have been canceled due to the restriction requirement. Applicant reserves the right to pursue the subject matter of claims 11-15 and 23-24 in a timely filed divisional application. Claims 1-10 and 15-22 are pending after the amendment.

Claim Objections

The Office has suggested that the phrase "defining a feature into the each of the release layer and the dielectric layer" is not clear. Applicant has amended the claim as suggested by the Examiner. Applicant respectfully requests that the claim objection from claim 1 be withdrawn.

Rejections under 35 U.S.C. § 112

Claims 1-10 and 16-22 were rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Applicant respectfully traverses this rejection.

Specifically, the Office suggests that it is not clear how the solvent comes into contact with the release layer because a barrier layer, a copper seed layer, and a copper layer cover the release layer. Further the Office has suggested that it is not clear how the copper seed layer, barrier layer, and conformal dielectric layer become separated and planarized as shown in Figure 10 since only the release layer is dissolved.

As to the first suggestion made by the Office, Applicant respectfully submits that it is well known to those skilled in the art that the solvent may initiate the release process by diffusing through the layers such as, for example, the barrier layer, a copper seed layer, and a copper layer. The fact that the layers are capable of diffusing fluids is not new nor unique, and is common knowledge to those skilled in the art. In addition, it is well known to those skilled in the art that there are many processes where liftoff starts at the edge of the wafer or at a deliberately introduced feature where the solvent may have direct access to the release layer. A side view of a wafer section is shown in the figures. Therefore, as known to those skilled in the art, numerous ways exist of applying a solvent to a release layer.

As to the second suggestion made by the Office, as known to those skilled in the art and as discussed in the specification of the present application, after the release layer is dissolved by the solvent, the layers above the release layer lift off from the structure. The use of ultrasound in the lift off operation has been added to the specification as indicated above in the "Amendment to the Specification" section. The subject matter added is not new matter because use of ultrasound in the lift off process is discussed in the document "Microposit® LOL™ 1000 and LOL™ 2000 Liftoff Layers" that was incorporated by reference into the as-filed patent application. The aforementioned document is being submitted in a concurrently filed IDS. With regard to the planarized surface, Applicant respectfully submits that planarization of the top layer as shown in Figure 10 is an optional feature as described in the specification. Therefore, Applicant respectfully submits that specification as filed enables one skilled in the art of semiconductor processing to make and/or use the invention. Consequently, Applicant respectfully requests that the Office withdraw the section 112 claim objections as to claims 1-10 and 16-22.

Rejections under 35 U.S.C. § 102

Claims 1-7 and 19-21 were rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Application Publication 2002/0137337 to Lu et al. This rejection is respectfully traversed.

To support a section 102 rejection, Lu would have to disclose all elements of the claimed inventions. Applicant respectfully submits that all elements of claim 1 are not disclosed by Lu. In one of the claimed features of claim 1, a release layer is formed over the dielectric layer. In contrast, Lu teaches that a stop layer (106) is applied over the dielectric layer (See, Lu Abstract, Figure 2A, 2B, 2C, 2D, and 2E). Therefore, among the many differences between the teachings of Lu and the features of claimed inventions, Lu does not teach the feature of the release layer being formed over the dielectric layer. The Office attempts to equate the sacrificial layer (108) of Lu with the release layer as claimed in claim 1. Applicant respectfully submits that the sacrificial layer (108) as taught by Lu is a material with a high CMP rate compared to the polish stop layer (106). Lu teaches that the sacrificial layer is removed by CMP. As is well known to those skilled in the art, chemical mechanical polishing typically includes planarizing materials mainly using mechanical polishing with the use of some chemicals. Therefore, Applicant respectfully submits that the sacrificial layer (108) is not the release layer as claimed in claim 1. Even if the sacrificial layer (108) of Lu is a release layer (a proposition with which Applicant disagrees), the sacrificial layer (108) is not formed over the dielectric layer. Therefore, Lu does not disclose all elements of claim 1 as is required in a section 102 rejection.

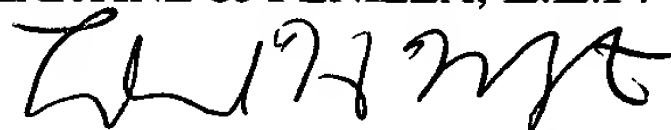
With respect to claim 19, Applicant submits that Lu does not disclose each and every element as is required in a section 102 rejection. As discussed above, Lu teaches the forming of a stop layer (106) over the dielectric. Therefore, Applicant respectfully submits that Lu does not teach the forming of a photosensitive release layer over the dielectric as claimed in

claim 19. The Office attempts to equate the sacrificial layer (108) of Lu with the photosensitive release layer as claimed in claim 19. As discussed above, Applicant respectfully submits that the sacrificial layer (108) is not a photosensitive release layer of the claimed inventions. Even if the sacrificial layer (108) of Lu is a photosensitive release layer (a proposition with which Applicant disagrees), the sacrificial layer (108) is not formed over the dielectric layer. Therefore, Lu does not disclose all elements of claim 19 as is required in a section 102 rejection. Consequently, Applicant respectfully requests that the section 102 rejection be withdrawn.

With regard to the dependent claims, the Applicants submit that the cited prior art reference does not disclose all the elements of the dependent claims and traverse the rejection of those claims. In addition, the dependent claims are submitted to be patentable for at least the same reasons as independent claims are patentable over the cited art of record. The Office indicated that claims 8-10, 16-18, and 22 are not rejected over the prior art.

Applicants respectfully submit that all of the pending claims are in condition for allowance. Accordingly, a notice of allowance is respectfully requested. If the Examiner has any questions concerning the present amendment, the Examiner is kindly requested to contact the undersigned at (408) 749-6900, ext. 6911. If any fees are due in connection with filing this amendment, the Commissioner is authorized to charge Deposit Account No. 50-0805 (Order No. NOVEP008).

Respectfully submitted,
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